CLAIMS :

1. A method of building a variable length error code, said method comprising the steps of :

(1) initializing the needed parameters : minimum and maximum length of codewords L_1 and L_{max} respectively, free distance d_{free} between each codeword (said distance d_{free} being for a VLEC code C the minimum Hamming distance in the set of all arbitrary extended codes), required number of codewords S ;

(2) generating a fixed length code C of length L_1 and minimal distance b_{min}, with $b_{min} = \min \{b_k ; k = 1, 2, ..., R\}$, b_k = the distance associated to the codeword length L_k of code C and defined as the minimum Hamming distance between all codewords of C with length L_k, and R = the number of different codeword lengths in C, said generating step creating a set W of n-bit long words distant of d ;

(3) storing in the set W all the possible L_1 – tuples distant of d_{min} from the codewords of C (said distance d_{min} for a VLEC code C being the minimum value of all the diverging distances between all possible couples of different-length codewords of C), and, if said set W is not empty, affixing at the end of all words one extra bit, said storing step replacing the set W by a new one having twice more words than the previous one and the length of each one of these words being $L_1 + 1$;

(4) deleting all the words of the set W that do not satisfy the c_{min} distance with all codewords of C, said distance c_{min} being the minimum converging distance of the code C ;

(5) in the case where no word is found or the maximum number of bits is reached, reducing the constraint of distance for finding more words ;

(6) controlling that all words of the set W are distant of b_{min}, the found words being then added to the code C ;

(7) if the required number of codewords has not been reached, repeating the steps (1) to (6) until the method finds either no further possibility to continue or the required number of codewords ;

(8) if the number of codewords of C is greater than S, calculating, on the basis of the structure of the VLEC code, the average length AL obtained by weighting each codeword length with the probability of the source, said AL becoming the AL_{min} if it is lower than AL_{min} , with AL_{min} = the minimum value of AL, and the corresponding code structure being kept in memory ;

said building method being moreover characterized in that, considering that all distributions of number of codewords for the best VLEC codes have a similar curve allure of a bell shape type, it is defined an optimal length value Lm until which the number of codewords increases with their length, whereas it decreases after said value Lm, said definition allowing to apply the so-called "Ls optimization" method with avoiding the edges of the curve and to work locally.

2. A method of building a variable length error code, said method comprising the steps of :

(1) initializing the needed parameters : minimum and maximum length of codewords L_1 and L_{max} respectively, free distance d_{free} between each codeword (said distance d_{free} being for a VLEC code C the minimum Hamming distance in the set of all arbitrary extended codes), required number of codewords S ;

(2) generating a fixed length code C of length L_1 and minimal distance b_{min}, with $b_{min} = \min \{b_k ; k = 1, 2, ..., R\}$, b_k = the distance associated to the codeword length L_k of code C and defined as the minimum Hamming distance between all codewords of C with length L_k, and R = the number of different codeword lengths in C, said generating step creating a set W of n-bit long words distant of d ;

(3) storing in the set W all the possible L_1 – tuples distant of d_{min} from the codewords of C (said distance d_{min} for a VLEC code C being the minimum value of all the diverging distances between all possible couples of different-length codewords of C), and, if said set W is not empty, affixing at the end of all words one extra bit, said storing step replacing the set W by a new one having twice more words than the previous one and the length of each one of these words being $L_1 + 1$;

(4) deleting all the words of the set W that do not satisfy the c_{min} distance with all codewords of C, said distance c_{min} being the minimum converging distance of the code C ;

(5) in the case where no word is found or the maximum number of bits is reached, reducing the constraint of distance for finding more words ;

(6) controlling that all words of the set W are distant of b_{min}, the found words being then added to the code C ;

(7) if the required number of codewords has not been reached, repeating the steps (1) to (6) until the method finds either no further possibility to continue or the required number of codewords ;

(8) if the number of codewords of C is greater than S, calculating, on the basis of the structure of the VLEC code, the average length AL obtained by weighting each codeword length with the probability of the source, said AL becoming the AL_{min} if it is lower than AL_{min}, with AL_{min} = the minimum value of AL, and the corresponding code structure being kept in memory ;

said building method being moreover characterized in that the deletion is realized not only in the last obtained group but also in the group of a given length value, in order to go back very quickly to smaller lengths, and, considering that all distributions of number of codewords for the best VLEC codes have a similar curve allure of a bell shape type, it is defined an optimal length value Lm until which the number of codewords increases with their length, whereas it decreases after said value Lm, said definition allowing to apply the so-called "Ls optimization" method with avoiding the edges of the curve and to work locally.

3. A VLEC code building method according to anyone of claims 1 and 2, in which the optimal value for Lm is Lm = Ls +1.

4. A device for carrying out a variable length error code building method according to anyone of claims 1 to 3.